On the Value Premium in Malaysia

Michael E. Drew[*] and Madhu Veeraraghavan[**]
[*]School of Economics and Finance, Queensland University of Technology
[**]School of Accounting and Finance, Griffith University

ABSTRACT

Davis, Fama and French (2000) report that the value premium in United States' stocks is robust. Herein, we present out-of-sample evidence for Malaysia, finding that value stocks outperform growth stocks and document an arbitrage opportunity. We observe that the mean monthly returns are substantially higher for the two mimic portfolios (SMB and HML) when compared with the market portfolio. For the period 1991 through 1999, an investor generated 1.92% (annually) holding the market portfolio in Malaysia, compared with the two mimic portfolios, SMB and HML with returns of 17.70% and 17.69% respectively. We also observe that the standard deviations for the two mimic portfolios are significantly lower than the standard deviation of the market portfolio. Moreover, the findings presented in this study reject the notion of survivorship bias advanced by Kothari, Shanken and Sloan (1995) and the data-snooping hypothesis attributed to Black (1993) and Mackinlay (1995) as an explanation for the value premium.

JEL Classification: *G 120, G150*
Keywords: *Asset pricing, multifactor models, value premium, arbitrage*

1. Introduction

IN THEIR ARTICLE (Characteristics, Covariances, and Average Returns: 1929 to 1997) Davis, Fama and French (2000) confirm the controversial findings of Rosenberg, Reid and Lanstein (1985) that firms with high ratios of book value of common equity to the market value of common equity (BE/ME) have higher returns than firms with low BE/ME ratios[1]. In addition, they confirm the robustness of the three-factor model of Fama and French (1993, 1996) that uses the market portfolio and mimicking portfolios for factors related to size (market capitalization) and style (BE/ME) to describe returns in the US over a 68 year period.

The finding that the value premium anomaly[2] is robust for the US over a 68 year period and that a multifactor asset pricing model does a better job of capturing the cross-section of average returns than beta, naturally, remains controversial. Fama and French (1998) (hereafter FF) find additionally that the value premium is pervasive for a sample of twelve major EAFE (Europe, Australia and the Far East) countries. FF estimate that, for the period 1975 through 1995, the difference in average returns of high and low BE/ME stocks is 7.68 per cent per year. Additionally, they suggest that the value premium is evident in emerging market returns, but admit that due to a short sample period and high volatility of returns, the asset pricing tests performed by FF (1998) for emerging markets were "quite imprecise."

[1] Significant contributions have been made by Banz (1981), Basu (1983), Rosenberg, Reid and Lanstein (1985), Fama and French (1992, 1993, 1995, 1996 and 1998), Lakonishok, Shleifer and Vishny (1994), Narasimhan and Titman (1993), Kothari, Shanken and Sloan (1995), Kandel and Stambaugh (1996), Jagannathan and Wang (1996), Berber and Lyon (1997), Daniel and Titman (1997), Knez and Ready (1997), Berk (2000) and Pastor and Stambaugh (2000).

[2] Following Davis, Fama and French (2000), the value premium anomaly is defined as the superior risk-adjusted performance of value stocks with high BE/ME over growth stocks with low BE/ME.

The lack of evidence on the important issue of whether value premium is pervasive in emerging markets requires immediate attention. In contrast to the body of literature analyzing the cross section of stock returns in developed markets, few studies have investigated whether such findings are corroborated in emerging markets. This is potentially important because such evidence may be sample specific, driven by economic, institutional and regulatory arrangements peculiar to developed markets.

In this paper we present detailed emerging-market evidence on the value premium for Malaysia. Using a multifactor model developed for the Malaysian setting, we report that the value premium is pervasive with the difference in average returns of high and low BE/ME providing an arbitrage opportunity for investors. We provide corroborating evidence to support Davis et al (2000) in that value stocks have higher risk-adjusted returns than growth stocks, rejecting the position of Black (1993), Campbell (2000) and MacKinlay (1995) that the value premium is sample specific.

Moreover, we report that the factors identified by FF (1993, 1996) seem to explain the variation in stock returns in Malaysia in a meaningful way and are not a result of seasonal phenomena[3]. The rest of the paper is organized as follows. In Section 2 a brief review of the literature is presented. Section 3 describes our data and methodology, with Section 4 providing the results. The closing remarks concerning the implications of the study and directions for future research are provided in Section 5.

2. Literature Review

In a remarkable paper, FF (1992) observe that the cross-section of average equity returns in the US shows little or no relation to the betas of the traditional CAPM. FF identify three risk factors (an overall market factor, firm size and book to market equity) to explain the cross-section of returns on US stocks. The central controversy of the contribution by FF (1992) is the notion that if stocks are priced rationally, risks must be multi-dimensional, as distinct from the monad-dimensional capital asset pricing model (CAPM).

FF (1996), provide a three-factor model explanation to the patterns in stock returns not explained by the traditional CAPM and claim that the anomalies disappear in their multifactor model. Their model states that the excess expected return on a portfolio is explained by:

(a) the excess return on a broad market portfolio;
(b) difference between the return on a portfolio of small stocks and the return on large stocks; and,
(c) difference between the return on a portfolio of high book to market equity stocks and the return on low book to market stocks.

The findings of FF suggest that high book to market equity firms have low earnings to book equity and positive slopes on the HML factor. Conversely, low book to market equity firms, have high earnings on book equity and have negative slopes on the HML factor.

The findings of FF have raised considerable controversy in academia. Kothari, Shanken and Sloan (1995) suggest that the value premium is due to survivorship bias; Black (1993) and Mackinlay

[3] See for example Dyl (1977), Rozeff and Kinney (1981), Reinganum (1983), Roll (1983), Keim (1983), Kato and Shallheim (1985), Keim and Stambaugh (1984), Brailsford and Easton (1991) and Brailsford (1993) for a discussion on January effect.

(1995) suggest that the value premium explanation of FF is due to data-snooping and Lakonishok, Shleifer and Vishny (1994) and Haugen (1995) argue that the value premium might be real but irrational. They suggest that the premium is a result of investor over-reaction that underprices value stocks and overprices growth stocks.

In another influential paper, Daniel and Titman (1997), (hereafter DT) suggest that it is not the covariance structure of returns that explains the cross-section of stock returns, but it is the characteristics itself that explain the cross-section of expected stock returns. DT raise two fundamental issues:

(a) whether there really are pervasive factors directly associated with size and BE/ME; and,
(b) whether there are risk premia associated with these factors.

In essence, DT attempt to establish a relationship between high returns generated on small size and high book to market stocks and their respective factor loadings. DT construct portfolios of stocks sorted on size and book to market equity ratio, paying special attention on the seasonality effect on these returns. DT separate the returns of the size and BE/ME portfolios in January and non-January months. They observe that the results of the FF constructed portfolios when separated for seasonality indicate that the size effect is exclusively a January phenomenon and the BE/ME effect occurs largely in January for bigger firms where they generate a return premium of 3 percent in January alone and 3 percent for the non January months.

In a reply to DT (1997), Davis et al (2000) extend the data on US stock returns back to 1926. They observe that the value premium in the United States stock returns is robust and more importantly the characteristic based model of DT is sample specific and claim that the three-factor model of FF (1996) explains the value premium better than the characteristic based model. The findings of Davis et al suggests that the evidence in favor of the characteristic model, provided by Daniel and Titman (1997), appears to be a feature of the sample period.

Further evidence to the debate on the robustness of factor based models versus characteristic based pricing model is provided by Berk (2000) and Pastor and Stambaugh (2000). Berk (2000) suggests that by sorting data into groups on variables known *a priori* to be correlated with equity returns the explanatory power of a correctly specified asset pricing model can be reduced. Therefore, the explanatory power of the model will always be smaller within a group than in the whole sample. Berk (2000) suggests that a methodology that sorts stocks into more groups, such as the one adopted by DT (1997) destroys the within group explanatory power of a correctly specified asset pricing model.

Pastor and Stambaugh (2000) state that there is virtually no difference between the FF risk model and the DT characteristic model as both models lead to similar portfolio choices within the investment universe constructed to exploit differences between the risk based model of FF and characteristic based model of DT. Their findings suggest that there is no difference between the factor-based model of FF and the characteristic based model of DT as expected returns are associated with characteristics in both models. The findings of Davis et al (2000), Berk (2000) and Pastor and Stambaugh (2000) has certainly shifted the focus from a better model debate to conducting further tests on the robustness of the FF multifactor models to determine if their findings for the US portfolios can be confirmed across different capital markets.
In light of these findings, this paper presents additional out of sample evidence on the value premium. We specifically ask:

(a) Is there a value premium in Malaysia? and,
(b) If so, is the value premium a result of survivorship bias or data-snooping hypothesis?

3. Data and Methods

Our analysis is restricted to firms with available returns data, on the Datastream[4] return files from December 1992 through December 1999. We investigate the relationship between the expected return of a certain portfolio, excess return on a broad market portfolio, firm size *(ME)* and style *(BE/ME)* by employing the following empirical model:

$$R_{pt} - R_{ft} = a_i + b_i\,(R_{mt}\text{-}R_{ft}) + siSMB + hiHML + \varepsilon_{it} \qquad (1)$$

R_{pt} is the average return of a certain portfolio *(S/L, S/M, S/H; B/L, B/M and B/H)*. R_{ft} is the risk free rate observed at the beginning of each month. *SMB* is the difference between the return on a portfolio of small stocks and the portfolio of big stocks; *HML* is the difference between the return on a portfolio of high book to market stocks and the return on a portfolio of low book to market stocks. The factor sensitivities b_i, s_i and h_i are the slopes in the time-series regression. We also explore the seasonal behavior of risk premiums by separating equation (1) for January and non-January months.

FF (1993) show that the cross-section of average stock returns on US common stocks show little or no relation to the betas of the (SLB) CAPM model or the consumption betas of the intertemporal asset pricing model. However, they document that, variables that are not associated with a standard or an equilibrium asset-pricing model explain the cross-section of average stock returns in a meaningful manner. Most importantly they observe that their three-factor model captures all CAPM average return anomalies.

We test the three-factor model in the Malaysian setting to validate the findings of FF for the US portfolios. They document that the book to market equity effect is a proxy for the distressed firm effect. In essence, firms with high book to market equity ratio are weak firms with low earnings and firms with low book to market equity ratio are strong firms with high earnings. FF also observe that the slopes on HML are positive, if firms are distressed and weak, and negative if firms are strong and have low book to market equity ratio.

FF's interpretation of the distressed firm effect (HML) has certainly stirred up the debate on whether firms with high book to market equity proxy for relative distress. Kothari, Shanken and Sloan (1995) argue that distress premium is a result of survivorship bias. Black (1993) and Mackinlay (1995) argue that the FF are involved in data snooping in the sense that researchers look for variables that are a priori related to average return and the results are therefore sample specific.

A very different argument has been advanced by Lakonishok, Shliefer and Vishny (1994) and Haugen (1995) who argue that the distress premium is irrational. They suggest that distress premium has no relationship whatsoever with being high book to market equity firms, but is a result of a typical investor overreaction which leads to underpricing of value stocks (stocks with high book to market equity) and overpricing of growth stocks (stocks with low book to market equity). In this paper we address the issue of survivorship bias by testing the three-factor model with a different data source and the data snooping hypothesis by testing the three-factor model for markets

[4] Primark Corporation is a global information services company. We used Datastream, a Primark brand, to obtain the data for this study.

other than the United States. Our approach of evaluating data-snooping hypothesis is consistent with the approach of Barber and Lyon (1997).

4. Results

A. Tests on the Size-BE/ME sorted portfolios

Table 1, Panel A reports the average excess returns on the six size-book to market equity sorted portfolios for the full sample. The results show that small stocks produce higher returns than big stocks and high book to market equity stocks produce higher returns than low book to market equity stocks. Further, it is interesting to note that the standard deviations associated with (RMRFT) are higher than the standard deviations of (SMB and HML). Since the average returns of (SMB and HML) are higher than the market return, and standard deviations lower than that of the market portfolio, we forward that the premium for the size effect and distressed firm effect is an arbitrage opportunity.

Table 1

Summary Statistics and Three-Factor Regressions for Simple Monthly Percent Excess Returns on 6 Portfolios Formed on Size and Book to Market Equity Ratio (BE/ME): 12/91 to 12/99, 96 Months

Rft is the Malaysia Base Lending Rate obtained from Datastream. At the end of December of each year t stocks are assigned to two portfolios of size (Small and Big) based on whether their June Market Equity (ME) defined as closing price times Number of shares outstanding is above or below the median ME. The same stocks are allocated in an independent sort to three-book equity to market equity portfolios (Low, Medium, and High) based on the breakpoints for the bottom 33.33 percent and top 66.67 percent. Low portfolios consist of firms with breakpoints less than 33.33 percent of median book to market equity. High portfolios consist of firms with breakpoints more than 66.67 percent of median book to market equity and the balance firms are assigned the medium portfolio.

Six ME-BE/ME portfolios are formed at the intersection of the two size portfolios and three book to market equity portfolios. The six portfolios formed are *(S/L, S/M, and S/H; B/L, B/M, and B/H).* Value-weight monthly returns on the six portfolios are calculated from the following July to June. The explanatory variables **RM, SMB, and HML** are defined as follows: RM (market return) is the value-weight market return on all stocks in the six portfolios and includes the negative Book Equity stocks which were excluded from the sample while forming BE/ME portfolios. SMB (Small minus Big) is the difference each month between the average of the returns of the three small stock portfolios *(S/L, S/M, and S/H)* and the average of the returns of the three big portfolios *(B/L, B/M, and B/H).* HML (High minus Low) is the difference between the average of the returns of the two high BE/ME portfolios *(S/H, B/H)* and the average of the returns on the two low BE/ME portfolios *(S/L, B/L).*

We define Book Equity (BE) as the book value of common shareholder's equity plus the balance sheet deferred taxes (if any) and minus the book value of preferred stocks. The BE/ME ratio used to form portfolios in December of each year t is the book common equity for the fiscal year ending in calendar year t-1 / market equity at the end of December of t-1. While forming portfolios we exclude negative Book equity firms, as they do not have meaningful explanations. We include firms only with ordinary equity for portfolio construction purposes.

Table 1
Panel A: Summary Statistics
Mean Monthly Returns (Full Sample)
Period: 12/91 to 12/99

PORTFOLIO	RPTRFT	RMRFT	SMB	HML
S/L	2.2732 (16.5311)[7]	0.1608 (10.8488)	1.4751 (5.3244)	1.4746 (6.0860)
S/M	1.9495 (15.8556)	0.1608 (10.8488)	1.4751 (5.3244)	1.4746 (6.0860)
S/H	3.0988 (17.6584)	0.1608 (10.8488)	1.4751 (5.3244)	1.4746 (6.0860)
B/L	-0.1367 (10.9776)	0.1608 (10.8488)	1.4751 (5.3244)	1.4746 (6.0860)
B/M	1.3231 (14.2259)	0.1608 (10.8488)	1.4751 (5.3244)	1.4746 (6.0860)
B/H	1.7098 (16.4746)	0.1608 (10.8488)	1.4751 (5.3244)	1.4746 (6.0860)

Table 1-Continued

Panel B: R_{pt}-R_{ft} = a_i+b_i(R_{mt}-R_{ft})+siSMB+hiHML+ε_{it}

Portfolio	a	B	S	h	R^2	F	DW
S/L	-0.825 (-1.257)[8]	0.918 (14.137)	1.801 (15.286)	0.200 (1.757)	0.87	215.724	2.180
S/M	-1.074 (-1.817)	0.922 (15.771)	1.384 (13050)	0.565 (5.521)	0.89	248.778	2.203
S/H	-0.676 (-1.310)	0.964 (18.920)	1.482 (16.031)	0.972 (10.899)	0.93	425.738	2.467
B/L	-0.856 (-2.086)	0.901 (22.185)	0.427 (5.803)	-0.003 (-0.533)	0.89	247.078	2.326
B/M	-0.502 (-0.927)	0.985 (18.389)	0.582 (5.987)	0.548 (5.847)	0.88	237.346	2.341
B/H	-1.215 (-2.143)	0.918 (16.364)	0.657 (6.457)	1.226 (12.489)	0.90	297.080	2.144

Table 1, Panel B reports the coefficients of the three-factor model. The results of Panel B show that the intercepts are not statistically significant at the 1 per cent level for any of the six size-book to market equity sorted portfolios and are indistinguishable from zero for majority of the portfolios. Our intercepts are not statistically significant for any of the size-book-to-market sorted portfolios in the spirit of Merton (1973). Merton (1973) states that standard asset-pricing models produce intercepts that are statistically indistinguishable from zero although this imposes a stringent standard. Hence, if the model in (1) is a parsimonious model and describes expected return in a meaningful pattern, the intercepts should be statistically indistinguishable from zero. We find that the intercepts are not statistically significant for any of the six size-book-to-market equity sorted portfolios.

We also observe that the overall market factor is close to one for all six size-book to market equity sorted portfolios. The *s* coefficient is positive and significant at the 1 per cent level for the small portfolios (S/L, S/M and S/H). Although the *s* coefficient for the big portfolios (B/L, B/M and B/H) is significant at the 1 per cent level it is diminishing when compared with the small portfolios. The h coefficient for the small portfolios increases monotonically and not significant for the (S/L) portfolio, but significant at the 1 per cent level for both (S/M and S/H) portfolios.

---

[7] Standard Deviations in parentheses.
[8] t-statistics in parentheses.

The *h* coefficient for the (B/L) portfolio is negative and insignificant, but positive and significant at the 1 per cent level for both (B/M and B/H) portfolios. We are not surprised that our results are consistent with the findings of FF (1993, 1995 and 1996) as in our opinion the multifactor version is robust and is able to describe the expected returns in an economically meaningful manner.

We also observe that the average R^2 for the six size-book to market equity sorted portfolios is 0.90 which implies that the independent variables explain 90% of the variation in the cross-section of average stock returns. Hence, the intercepts are statistically indistinguishable from zero. We do not observe any evidence of autocorrelation[5] as the computed Durbin-Waston *(d)* statistic is higher than the upper bound value at the 1 per cent level.

The lower and upper bound limits at the 1 per cent level for (n=95 and k′=3) are (1.468 and 1.596). Since the d statistic for the six size-book to market equity sorted portfolios is greater than the upper bound limit we do not reject the null hypothesis of no autocorrelation in the data. We also conduct tests to determine if the assumption concerning no evidence of multicollinearity is violated. The tests of multicollinearity reveal no evidence of multicollinearity among the regressors as the condition index and variance inflation factors do not violate the rule of thumb[6].

B. Seasonal Behavior of Risk Premiums

Table 2, Panel A shows the average excess returns on the six size-book to market equity sorted portfolios for the sample excluding the January month. We separate January month from the sample to understand the behavior of risk premiums in January versus non-January months. The results show that small stocks produce higher returns than big stocks and high book to market equity stocks produce higher returns than low book to market equity stocks. This is consistent with our findings of the full sample in Table 1.

Further, it is interesting to note that the standard deviations associated with (RMRFT) are higher than the standard deviations of (SMB and HML). Since the average returns of (SMB and HML) are higher than the market return, and standard deviations lower than that of the market portfolio, we conjecture that the premium for the size effect and distressed firm effect is an arbitrage opportunity whether January is in the sample or out of the sample.

[5] Chaterjee and Price (1991) and Gujarati (1999) observe that no further analysis of autocorrelation is needed when the computed d statistic is greater than the upper bound limit. They suggest that the null hypothesis of no autocorrelation should not be rejected when the computed d is greater than the upper bound limit.

[6] Gujarati (1995) observes that there is no evidence of multicollinearity if the condition index and the variance inflation factor are below 10. We observe that the condition index and the variance inflation factors for the full sample, sample excluding the January month and the January month only sample do not exceed 10 for any of the size-book to market equity sorted portfolios. The Diagnostics are reported in Table 4. We therefore do not reject the null hypothesis of no multicollinearity among the regressors.

Table 2
Panel A: Summary Statistics
Mean Monthly Returns (Excluding January)
Period: 12/91 to 12/99

PORTFOLIO	RPTRFT	RMRFT	SMB	HML
S/L	2.7553	0.4937	1.5813	1.4992
	(16.7914)[9]	(11.1323)	(5.4110)	(6.3162)
S/M	2.4800	0.4937	1.5813	1.4992
	(16.1781)	(11.1323)	(5.4110)	(6.3162)
S/H	3.5151	0.4937	1.5813	1.4992
	(18.0398)	(11.1323)	(5.4110)	(6.3162)
B/L	0.1816	0.4937	1.5813	1.4992
	(11.1065)	(11.1323)	(5.4110)	(6.3162)
B/M	1.6894	0.4937	1.5813	1.4992
	(14.5661)	(11.1323)	(5.4110)	(6.3162)
B/H	2.1355	0.4937	1.5813	1.4992
	(16.8886)	(11.1323)	(5.4110)	(6.3162)

Table 2-Continued

Panel B: R_{pt}-R_{ft} = a_i+b_i(R_{mt}-R_{ft})+siSMB+hiHML+ε_{it}

Portfolio	a	b	S	h	R^2	F	DW
S/L	-0.935	0.897	1.835	0.230	0.87	198.350	2.223
	(-1.345)[10]	(13.320)	(14.943)	(1.968)			
S/M	-1.227	0.901	1.432	0.599	0.89	236.265	2.174
	(-1.819)	(15.007)	(13.077)	(5.738)			
S/H	-0.843	0.947	1.514	0.998	0.93	397.690	2.336
	(-1.549)	(17.960)	(15.745)	(10.883)			
B/L	-0.974	0.881	0.463	-0.008	0.89	244.146	2.517
	(-2.322)	(21.692)	(6.254)	(-0.117)			
B/M	-0.650	0.967	0.628	0.580	0.89	226.904	2.242
	(-1.145)	(17.569)	(6.256)	(6.058)			
B/H	-1.282	0.897	0.691	1.256	0.91	285.574	2.177
	(-2.158)	(15.592)	(6.580)	(12.553)			

Table 2, Panel B reports the coefficients of the three-factor model. The results of Panel B show that the intercepts are not statistically significant for any of the six size-book-to-market equity sorted portfolios. More importantly our intercepts are not statistically significant at the 1 per cent level for any of the six size-book to market equity sorted portfolios.

We also observe that the overall market factor is close to one for all six size-book to market equity sorted portfolios. The *s* coefficient is positive and significant at the 1 per cent level for the small portfolios (S/L, S/M and S/H). Although the *s* coefficient for the big portfolios (B/L, B/M and B/H) is significant at the 1 per cent level it is diminishing when compared with the small portfolios. The *h* coefficient for the small portfolios increases monotonically and is not significant for the (S/L) portfolio, but significant at the 1 per cent level for both (S/M and S/H) portfolios.

The *h* coefficient for the (B/L) portfolio is negative and insignificant, but positive and significant at the 1 per cent level for both (B/M and B/H) portfolios. In our view the three-model is a robust model as the entire data is picked up again in the sample excluding the January month. The model explains the variation in the expected returns in a convincing manner irrespective of whether January is in the sample or out of the sample.

[9] Standard Deviations in parentheses.
[10] t-statistics in parentheses.

We also observe that the average R^2 for the six size-book to market equity sorted portfolios is 0.90 which implies that the independent variables explain 90% of the variation in the cross-section of average stock returns. The results of the sample excluding January month are very similar to the findings of the full sample. We also reject any evidence of autocorrelation as the computed Durbin-Waston *(d)* statistic is higher than the upper bound value at the 1 per cent level. The lower and upper bound limits at the 1 per cent level for (n=87 and k′=3) are (1.452 and 1.587). Since the d statistic for the six size-book to market equity sorted portfolios is greater than the upper bound limit we do not reject the null hypothesis of no autocorrelation in the data.

Table 3, Panel A shows the average returns for the six size-book to market equity sorted portfolios for the January month only sample. The results indicate that the mean portfolio returns for all six portfolios are negative. The mean market returns are also negative for all six portfolios. However, the mean portfolio returns for (SMB and HML) are positive and therefore we are convinced that there is an arbitrage opportunity. It is important to note that the standard deviations for (SMB and HML) are lower than the standard deviation of the market portfolio. Our findings do not support the turn of the year effect as the portfolios generate negative returns in the January month only sample.

Table 3
Panel A: Summary Statistics
Mean Monthly Returns (Only January),
Period: 12/91 to 12/99

PORTFOLIO	RPTRFT	RMRFT	SMB	HML
S/L	-2.9704 (13.0934)[11]	-3.4596 (6.4491)	0.3906 (4.3941)	1.2065 (2.6741)
S/M	-3.8194 (10.9035)	-3.4596 (6.4491)	0.3906 (4.3941)	1.2065 (2.6741)
S/H	-1.4287 (12.7858)	-3.4596 (6.4491)	0.3906 (4.3941)	1.2065 (2.6741)
B/L	-3.5986 (9.3686)	-3.4596 (6.4491)	0.3906 (4.3941)	1.2065 (2.6741)
B/M	-2.6610 (9.5468)	-3.4596 (6.4491)	0.3906 (4.3941)	1.2065 (2.6741)
B/H	-2.9205 (10.6652)	-3.4596 (6.4491)	0.3906 (4.3941)	1.2065 (2.6741)

Table 3-Continued

Panel B: R_{pt}-R_{ft} = a_i+b_i(R_{mt}-R_{ft})+siSMB+hiHML+ε_{it}

Portfolio	a	B	S	h	R^2	F	DW
S/L	1.811 (1.066)[12]	1.669 (5.789)	0.622 (1.067)	0.657 (0.785)	0.95	26.144	3.116
S/M	0.378 (0.301)	1.624 (7.641)	-0.141 (-0.328)	1.216 (1.968)	0.96	33.727	2.496
S/H	2.453 (4.524)	1.657 (18.002)	0.401 (2.156)	1.426 (5.331)	0.99	255.844	3.103
B/L	1.741 (1.709)	1.640 (9.482)	-0.793 (-2.268)	0.486 (0.967)	0.96	37.779	2.461
B/M	2.094 (2.186)	1.664 (10.237)	-0.774 (-2.357)	1.037 (2.195)	0.97	44.603	2.704
B/H	0.807 (0.449)	1.646 (5.390)	-0.551 (-0.893)	1.776 (2.001)	0.91	14.925	2.978

[11] Standard Deviations in parentheses.
[12] t-statistics in parentheses.

Table 3, Panel B presents the results for coefficients in the regression. We observe that the intercepts for (S/H and B/M) are statistically significant at the 1 per cent and 5 per cent level respectively. The intercepts for the remaining portfolios are not statistically significant at the 1 per cent level.

The *b* coefficient is greater than one for all portfolios. The *s* coefficient is not significant for any of the six size-book to market equity sorted portfolios. It is worth mentioning that the *s* coefficient was significant at the 1 per cent level in both the full sample and in the sample excluding the January month. If the model in (1) is robust only in January, the coefficients should have been highly significant. Our findings reveal that the coefficients are not statistically significant for the January month only sample.

The *h* coefficient is positive and not significant for the (S/L and S/M) portfolios but significant at the 1 per cent level for the (S/H) portfolio. The *h* coefficient for the big portfolios is not significant at the 1 per cent level. Our results are consistent with the previous findings of FF in that the overall market factor, size and book to market equity effect help explain the variation in the cross-section of average stock returns. We also find that the three-factor model is robust throughout the sample period and reject any claim that the size or book to market equity effect is exclusively a January phenomenon.

We also observe that the average R^2 for the six size-book to market equity sorted portfolios is 0.95 which implies that the independent variables explain 95% of the variation in the cross-section of average stock returns. We also reject any evidence of autocorrelation as the computed Durbin-Waston *(d)* statistic is higher than the upper bound value at the 1 per cent level. The lower and upper bound limits at the 1 per cent level for ($n=8$ and $k'=3$) are (0.229 and 2.102). Since the d statistic for the six size-book to market equity sorted portfolios is greater than the upper bound limit we do not reject the null hypothesis of no autocorrelation in the data.

Table 4
Collinearity Diagnostics (Full Sample)

Portfolio	**Variable**	**Condition Index**	**Variance Inflation Factor**
S/L	RMRFT	1.204	1.340
	SMB	1.372	1.062
	HML	1.939	1.292
S/M	RMRFT	1.204	1.340
	SMB	1.372	1.062
	HML	1.939	1.292
S/H	RMRFT	1.204	1.340
	SMB	1.372	1.062
	HML	1.939	1.292
B/L	RMRFT	1.204	1.340
	SMB	1.372	1.062
	HML	1.939	1.292
B/M	RMRFT	1.204	1.340
	SMB	1.372	1.062
	HML	1.939	1.292
B/H	RMRFT	1.204	1.340
	SMB	1.372	1.062
	HML	1.939	1.292

Table 4 - Continued
Collinearity Diagnostics (Only January month)

Portfolio	Variable	Condition Index	Variance Inflation Factor
S/L	RMRFT	1.086	1.662
	SMB	2.090	3.152
	HML	3.443	2.414
S/M	RMRFT	1.086	1.662
	SMB	2.090	3.152
	HML	3.443	2.414
S/H	RMRFT	1.086	1.662
	SMB	2.090	3.152
	HML	3.443	2.414
B/L	RMRFT	1.086	1.662
	SMB	2.090	3.152
	HML	3.443	2.414
B/M	RMRFT	1.086	1.662
	SMB	2.090	3.152
	HML	3.443	2.414
B/H	RMRFT	1.086	1.662
	SMB	2.090	3.152
	HML	3.443	2.414

Table 4 - Continued
Collinearity Diagnostics (Sample excluding January month)

Portfolio	Variable	Condition Index	Variance Inflation Factor
S/L	RMRFT	1.202	1.352
	SMB	1.401	1.062
	HML	1.959	1.315
S/M	RMRFT	1.202	1.352
	SMB	1.401	1.062
	HML	1.959	1.315
S/H	RMRFT	1.202	1.352
	SMB	1.401	1.062
	HML	1.959	1.315
B/L	RMRFT	1.202	1.352
	SMB	1.401	1.062
	HML	1.959	1.315
B/M	RMRFT	1.202	1.352
	SMB	1.401	1.062
	HML	1.959	1.315
B/H	RMRFT	1.202	1.352
	SMB	1.401	1.062
	HML	1.959	1.315

In our opinion, there exists an arbitrage opportunity for investors in Malaysia. This opportunity is created, as the mean returns are higher for the two mimic portfolios, (SMB and HML) when compared with the returns of the market. We also find that the standard deviations of (SMB and HML) are lower than the standard deviation of the market portfolio. In our view, investors should take advantage of this asset-pricing model as we clearly document an arbitrage opportunity in Malaysia. We are neither surprised by our findings of an arbitrage opportunity nor do we think that this, is a mystery waiting to be unravelled, as multifactor models such as the one tested here, imply that covariance with the market is not enough for measuring risk.

5. Conclusion

Our findings suggest that value stocks outperform growth stocks on a risk-adjusted basis in the Malaysian setting. A simple sort on size and book to market equity ratio generates significant abnormal returns. The two mimic portfolios, SMB and HML, incorporated to capture the risk factors related to size and book to market equity, generate average annual returns of 17.70 and 17.69 per cent per annum respectively. The standard deviations for the two portfolios are were estimated at 5.32 and 6.08 per cent respectively.

The average annual return generated by the market, or index investing, was 1.92 per cent with a standard deviation of 10.84 per cent. Our findings clearly document an arbitrage opportunity for investors, in that the returns for SMB and HML are substantially higher than that of the market.

Our findings for Malaysia suggest that the value premium is real and rational. We deduct that survivorship bias or data-snooping hypothesis cannot explain our results. Our findings are consistent with that of Davis et al (2000) for US portfolios and have serious implications for the arguments advanced by Kothari, Shanken and Sloan (1995), Black (1993) and Mackinlay (1995).

The results presented in this paper have striking implications for corporate finance in Malaysia, particularly relating to the cost of capital, and for investors who seek mean-variance efficient portfolios. We also reject the claim that the size and book to market equity effect are a seasonal phenomenon. Our results show otherwise, in that the explanatory variables are powerful throughout the sample period and therefore we are able to reject the presence of the turn of the year effect convincingly.

If asset-pricing is rational, the multifactor model of FF (1996) is a parsimonious representation of the risk factors as the model explains the variation in the cross-section of average stock returns in an economically meaningful manner. However, if asset-pricing is irrational, out of sample evidence such as the one presented in this paper and elsewhere should not be evident.

We are more than convinced at this point in time that asset-pricing is rational and so is the multifactor conception of the asset-pricing model. To further advance the debate, additional tests on the robustness of the multifactor model in other emerging markets is required to deepen our understanding of the economic reasons behind the risk premia. This path will take care of the data-snooping and survivorship bias hypothesis. An equally important issue is to test whether the zero investment portfolios (SMB and HML) can be linked to economic fundamentals. This is an issue we will explore in our next paper.

References

Banz, Rolf W., 1981, The relation between return and market value of common stocks, *Journal of Financial Economics* 9, 3-18.

Braber, Brad M., and John D. Lyon., 1997, Firm Size, Book-to-Market Ratio, and Security Returns: A Holdout Sample of Financial Firms, *Journal of Finance* 52, 875-883.

Basu, Sanjoy, 1983, The relationship between earnings yield, market value, and return for NYSE common stocks: Further evidence, *Journal of Financial Economics* 12, 129-156.

Berk, Jonathan B., 2000, Sorting Out Sorts, *Journal of Finance* 55, 407-427.

Black, Fischer, 1993, Beta and return, *Journal of Portfolio Management* 20, 8-18.

Brailsford, Tim J., 1993, Seasonality and institutional factors in the New Zealand Equity Market, *Pacific Accounting Review* 5, 1-26.

Brailsford, Tim J., and S.A. Easton, 1991, Seasonality in Australian Share Price Indices between 1936 and 1957, *Accounting and Finance* 31, 69-85.

Branch, Ben, 1977, A tax loss trading rule, *Journal of Business* 50, 198-207.

Campbell, John Y., 2000, Asset pricing at the millennium, *Journal of Finance* 55, 1515-1567.

Chatterjee, Samprit, and Bertram, Price., 1991, Regression Analysis By Example, John Wiley and Sons, INC.

Daniel, Kent, and Sheridan, Titman, 1997, Evidence on the Charcteristics of Cross Sectional Variation in Stock Returns, *Journal of Finance* 52, 1-33.

Davis, J, Eugene F. Fama, and Kenneth R. French., 2000, Characteristics, Covariances and average returns: 1929-1997. Journal of Finance 55, 389-406.

DeBondt, Werner F.M., and Richard H. Thaler, 1987, Further evidence on investor overreaction and stock market seasonality, *Journal of Finance* 42, 557-581.

Dyl, Edward A., 1977, Capital gains taxation and year-end stock market behavior, *Journal of Finance* 32, 165-175.

Fama, Eugene F., and Kenneth R. French, 1992, The cross-section of expected stock returns, *Journal of Finance* 42, 427-465.

Fama, Eugene F., and Kenneth R. French, 1993, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33, 3-56.

Fama, Eugene F., and Kenneth R. French, 1995, Size and Book-to-market factors in earnings and returns, *Journal of Finance* 50, 131-155.

Fama, Eugene F., and Kenneth R. French, 1996, Multifactor explanations of asset pricing anomalies, *Journal of Finance* 51, 55-84.

Fama, Eugene F., and Kenneth R. French, 1998, Value versus growth: The international evidence, *Journal of Finance* 53, 1975-1999.

Gujarati, Damodar N., 1995, Basic Econometrics, McGraw-Hill, Inc.

Gujarati, Damodar N., 1999, Essentials of Econometrics, Irwin McGraw-Hill.

Jagannathan, Ravi, and Zhenyu Wang, 1996, The Conditional CAPM and the cross-section of expected returns, *Journal of Finance* 51, 3-53.

Kandel, Shmuel, and Robert F. Stambaugh, 1996, On the predictability of stock returns: An asset allocation perspective, *Journal of Finance* 51, 385-424.

Kato, K., and J. Shallheim, 1985, Seasonal and Size anomalies in the Japanese stock market, *Journal of Financial and Quantitative Analysis* 20, 243-260.

Keim, Donald B., 1983, Size related anomalies and stock return seasonality, *Journal of Financial Economics* 12, 13-32.

Keim, Donald B., and Robert F. Stambaugh, 1984, A further investigation of the weekend effect in stock returns, *Journal of Finance* 39, 819-840.

Knez, Peter J., and Mark J. Ready, 1997, On the robustness of size and book-to-market in cross-sectional regressions, *Journal of Finance* 52, 1355-1382.

Kothari, S. P., Jay Shanken, and Richard G. Sloan, 1995, Another look at the cross-section of expected stock returns, *Journal of Finance* 50, 185-224.

Lakonishok, Josef, Andrei Shleifer, and Robert W. Vishny, 1994, Contrarian investment, extrapolation and risk, *Journal of Finance* 49, 1541-1578.

MacKinlay, A. Craig, 1995, Multifactor models do not explain deviations from CAPM, *Journal of Financial Economics* 38, 3-28.

Merton, Robert C., 1973, An Intertemporal Capital Asset Pricing Model, *Econometrica* 41, 867-887.

Narasimhan, Jegadeesh, and Sheridan Titman, 1993, Returns to buying winners and selling losers: Implications for stock market efficiency, *Journal of Finance* 38, 65-91.

Pastor, Lubos and Robert F. Stambaugh., 2000, Comparing asset pricing models: an investment perspective, *Journal of Financial Economics* 56, 335-381.

Reinganum, Marc R., 1983, The anomalous stock market behavior of small firms in January: Empirical tests for tax-loss selling effects, *Journal of Financial Economics* 12, 89-104.

Roll, Richard, 1983, Vas Ist Das?, *Journal of Portfolio Management* 9, 18-28.

Rosenberg, Barr, Kenneth Reid and Ronald Lanstein, 1985, Persuasive evidence of market inefficiency, *Journal of Portfolio Management* 11, 9-17.

Rozeff, Michael S., and William R. Kinney, 1976, Capital market seasonality: The case of stock returns, *Journal of Financial Economics* 3, 379-402.